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Research paper

Adverse Childhood Experiences (ACE) in outpatients with anxiety and depressive disorders and their association with psychiatric and somatic comorbidity and revictimization. Cross-sectional observational study

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ABSTRACT

Background: This study aims to establish prevalence of Adverse Childhood Experiences (ACE) and their association with somatic comorbidity and adult adverse events (AAE) in outpatients with anxiety or depressive disorders.

Methods: Cross-sectional observational design. Specialty mental health outpatients classified with DSM-IV-TR anxiety or depressive disorder filled-out the ACE-IQ and the AAE-IQ. T-tests, ANOVA, logistic regressions andChi-square analyses were performed and stratified for ACE score ≥4(high) versus ACE <4(low). Gender differences were explored.

Results: From May 2015 -November 2016, in 298 consecutive patients 77.2% reported at least one ACE, 58.7% reported multiple ACE (mean 2.92). Scores were highest in Post-Traumatic Stress Disorder (PTSD) and in case of comorbid mental disorders. Somatic comorbidity was not associated with ACE-scores. AAE scores were significantly ($t = -9.33$, $p < .001$) higher in the high ACE-group ($M = 4.09$ SD = 2.42) versus the low-ACE group ($M = 1.63$ SD = 1.70), indicating general revictimization. An association between sexual ACE and sexual revictimization was found as well ($\chi 2 = 86.14$, $p < .001$).The effects did not differ for males and females.

Conclusions: ACE and AAE are highly prevalent in depressive and anxiety disorders PTSD and psychiatric comorbidity are associated with higher scores, somatic comorbidity is not. Indications for general and sexual revictimization are shown. Further research is needed.

Limitations: Selection bias may have influenced results on somatic comorbidity, as patients with obvious somatic comorbidity usually get referred to other health services. The generalisability of the results may be limited as non-Dutch speaking immigrants were excluded.

1. Introduction

1.1. Background

Adverse Childhood Experiences (ACE) are traumatic experiences that may include sexual, physical or emotional abuse or emotional and physical negligence, as well as adverse familial circumstances that occurred during childhood (Felitti et al., 1998, https://www.cdc.gov/violenceprevention/acestudy/ace_brfss.html, https://www.cdc.gov/violenceprevention/acestudy/about.html). ACE are associated with mental disorders such as anxiety disorders (Moffitt et al., 2007), depressive disorders (Kessler et al., 1997), health-harming behaviours (M.A. Bellis et al., 2014a), poor life-course health and social outcomes (M.A. Bellis et al., 2014b), addiction (Kendler et al., 2000), suicidal behaviour mediated by maladaptive personality disorder (Perez et al., 2016), and post-traumatic stress disorders (PTSD) (Jonas et al., 2011) in children and adults (De Venter et al., 2013; Hovens et al., 2010; Hovens et al., 2015; Mullen et al., 1996; Gibb et al., 2007). An ACE score of 4 or more is associated with depressive disorders, suicide attempts and alcohol abuse in adult life (Felitti et al., 1998;

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Edwards et al., 2003; Dube et al., 2002).

Many traumatic experiences in childhood are forced upon children by people on who they depend and who should protect them. Such traumatised children may develop post-traumatic stress symptoms but also disturbed affect regulation and dysfunctional interpersonal relationships (Olff, 2013). Hence, ACE may not only be a predictor of adult psychiatric disorders, but also of repetitive trauma in adulthood. An association between childhood maltreatment and sexual revictimization in adult life was indeed established in general population studies for both women and men (Werner et al., 2016; Fergusson et al., 1997; Roodman and Clum, 2001; Desai et al., 2002; Filipas and Ullman, 2006).

ACE seem to influence the immune system and to be associated with the onset of asthma in children (Exley et al., 2015). Other chronic medical conditions might be associated as well. However, recent general population studies showed ambiguous results regarding the relationship between ACE and somatic illness at adult age (Iniguez, 2016; Bellis et al., 2015). A recent systematic review in the general population found weak associations with obesity or Diabetes Mellitus for an ACE score of four or more, and moderate associations with cancer, cardiac or respiratory disease. However risks, for behaviour such as smoking, addiction, sexual risk-taking, interpersonal and self-directed violence as well as for mental disorder and addiction were much higher (Hughes et al., 2017).

1.2. Rationale

Although it is clear that ACE are an important factor in risk full behaviours and several mental disorders, most studies have been performed in community samples and specialty subgroups such as juvenile offenders (Basto-Pereira et al., 2016), suicide attempters (Perez et al., 2016), persons with obesity (El Mhamdi et al., 2018) and medical evaluation centers (Felitti et al., 1998). The relevance of this association in the clinical practice of specialty mental health clinics for anxiety and depressive disorders has not been explored. In addition, the association with chronic medical conditions such as Diabetes Mellitus and cardiovascular disorder has remained unexplored in this setting. In general, trauma is explored during intake mostly based on what the patient presents himself, or on specific interests of the interviewing clinician, without systematic attention for the conundrums described above. Exploration of the prevalence of adverse experiences during childhood, but also in adulthood (adult adverse events (AAE)), and its association with current mental disorders and problems as well as somatic illness is needed in order to establish its relevance for clinical practice and further research. Findings can give clues about what patient groups need specific attention regarding ACE, and whether this is only relevant for patient with PTSD or for a broader range of anxiety disorders as well as depressive disorders. So far, such an exploration in the outpatient specialty mental health setting is lacking. This study aims to do this.

1.3. Aims of the study

1) To establish the range of ACE and AAE scores, and percentage of scores ≥4 in specialty mental health outpatients presenting themselves with anxiety disorders, depressive disorders, and PTSD.
2) To explore the association of ACE with psychiatric and somatic comorbidity.
3) To explore the association of ACE with AAE for general and sexual revictimization.

Moreover, we explored whether the effects with regard to general and sexual revictimization differed between males and females.

1.4. Hypotheses

We hypothesize that ACE scores will be elevated compared to general population level amongst patients with anxiety and depressive disorders, and will be highest in PTSD.

We hypothesize that high ACE scores (≥ 4) will be associated with mental and somatic comorbidity.

We hypothesize that high ACE scores will be associated with revictimization, as both general (AAE) and sexual adverse experiences.

2. Methods

2.1. Design

Cross-sectional observational design. The study inclusion took 18 months, from May 15th 2015 until November 15th 2016. The study is reported according to STROBE guidelines (Von Elm et al., 2014). The scientific committee of GGz Breburg approved the study protocol.

2.2. Setting

Outpatient specialty mental health setting at GGz Breburg, the Netherlands. All patients visiting the outpatient department were screened at intake with the ACE-IQ (31, http://www.who.int/violence_injury_prevention/violence/activities/adverse_childhood_experiences/en/) and the AAE-IQ. The instruments mentioned at variables are part of a standard Patient Related Outcome Measures procedure, assessed by a trained professional, who is a specialised mental health nurse or psychologist. Before the patients started to fill in the questionnaires, participants were advised that some questions might be confronting; that they could stop whenever they wanted and if they experienced discomfort because of the questions after the intake and before the start of treatment, they could contact the intaker for help.

2.3. Participants

Eligible patients were consecutive patients presenting themselves with anxiety disorders and depressive disorders at the specialty mental health outpatient clinic. The diagnoses were made by the clinical psychologist supervised by the psychiatrist or by the psychiatrist of the outpatient clinic following the classification of the Diagnostic and Statistical Manual (DSM)-IV-TR, which is standard clinical practice in specialized mental health care in the Netherlands. The patients received information at intake that patient related outcome measures assessed for diagnosis and treatment could be used for research on an anonymous basis, unless they refused. Data of non-consenting patients were not included in the study. Exclusion criteria were psychosis and insufficient knowledge of the Dutch language to fill in questionnaires. The outpatient specialty mental health setting were this study took place does not provide treatment for patients with serious substance use disorders, as those patients are primarily treated in treatment centres for substance use disorders, or in case of severe psychiatric comorbidity in so-called ‘double-diagnosis’ health care facilities.

2.4. Variables/data sources/measurement

The ACE International Questionnaire (ACE-IQ) is developed by the WHO. It is intended to measure ACEs in all countries, and the association between them and risk behaviours in later life. ACE-IQ is designed for administration to people aged 18 years and older. Questions cover family dysfunction; physical, sexual and emotional abuse and neglect by parents or caregivers; peer violence; witnessing community violence, and exposure to collective violence. ACE-IQ is currently being validated through trial implementation as part of broader health surveys (http://www.who.int/violence_injury_prevention/violence/activities/adverse_childhood_experiences/global_research_network/en/). Development has been ongoing and for this study, the available version in 2015 was used. This covers mostly ACE indicating family dysfunction, physical, sexual and emotional abuse and neglect by

Table 1
Assessment and instruments.

Instrument	Assesses	Mode of assessment	Characteristics of instrument
Adverse Childhood Experiences International Questionnaire(2015) (ACE-IQ) (31)	Adverse Childhood Experiences until age 18 with a focus on family environment.	Self-report, 5–10 minutes	10 questions. If a question is answered as yes, one point is scored. Maximum score is 10.
Adverse Adult Experiences International Questionnaire (AAE-IQ)	Adverse Childhood Experiences from age 18.	Self-report, 5–10 minutes	If a question is answered as yes, one point is scored. Maximum score is 10.
Psychiatric examination	DSM-IV-TR classification	Clinical interview, 60 minutes	Diagnostic classification and indication for treatment, taking history including traumatic experiences, classifying mental disorders as DSM-IV-TR as well as Axis 3 Chronic medical conditions

parents or caregivers. This version used is shown in appendix. It was translated from English to Dutch and back-translated before use in this study (Del Greco et al., 1987). For the purpose of this study, the ACE-IQ was adapted to explore similar experiences in adults (AAE-IQ). The assessment and instruments are summarised in Table 1.

2.5. Bias

The study explores the associations between ACE, AAE and psychiatric disorders as well as chronic medical conditions in a study group of patients willing to participate in diagnosis and treatment of their mental condition at a specialty mental health clinic. This may influence the study as it may enhance willingness to report traumatic experiences compared to population studies where no treatment is offered to study participants. This should be taken into account with regard to the generalisability of the results.

2.6. Study size

The study size was determined by the number of eligible patients that presented themselves during the inclusion period. The number of participants, $N = 298$, was deemed sufficient to explore the variables that were taken into account with sufficient power to find a significant association (Nunnally, 1994).

2.7. Quantitative variables

Demographic variables were age and gender. Diagnostic and Statistical Manual (DSM)-IV-TR classifications were taken into account as variables (American Psychiatric Association, 2000); also, comorbidity, psychiatric or somatic, were taken into account. ACE and AAE scores were used, and sexual adverse experiences were specified. The variables were categorised. A variable *main diagnosis* was operationalised, that makes a distinction between participants with depression, anxiety, PTSD or another psychiatric classification as the main diagnosis. A variable *Comorbidity* was operationalised, that makes a distinction between participants with only one main diagnosis, such as depression, anxiety, PTSD, and those with a comorbid diagnosis besides the main diagnosis. For example, depression comorbidity indicates that the participant has depression as the main diagnosis with another comorbid psychiatric diagnosis as DSM-IV-TR classification.

2.8. Statistical methods

Descriptive analyses were conducted to describe the sample and were stratified for ACE score ≥ 4 compared to the group with ACE < 4. T-tests and Chi-square analyses were performed in order to assess group differences. ANOVA was conducted in order to compare ACE and AAE scores between groups with different diagnoses. ACE and AAE scores were included as sum score of the ten items. Moreover, we conducted logistic regression analyses correcting for age and gender to assess general and sexual revictimization: an interaction term with gender was added to gain insight into differential effects per gender. For sexual revictimization analysis was performed on the questions pertaining specifically to sexual abuse in the ACE and the AAE questionnaire.

3. Results

3.1. Participant characteristics

During the inclusion period, 394 patients presented themselves at the outpatient clinic, 298 of which were eligible and consenting. The flowchart is shown in Fig. 1.

3.2. Outcome data

Table 2 shows the characteristics of the sample in terms of demographics, ACE and AAE scores and diagnosis, stratified by ACE group (i.e. ACE ≥ 4 compared to the group with ACE < 4). One hundred thirty (43,6%) patients were male, 168 (56,4%) were female. Mean age was

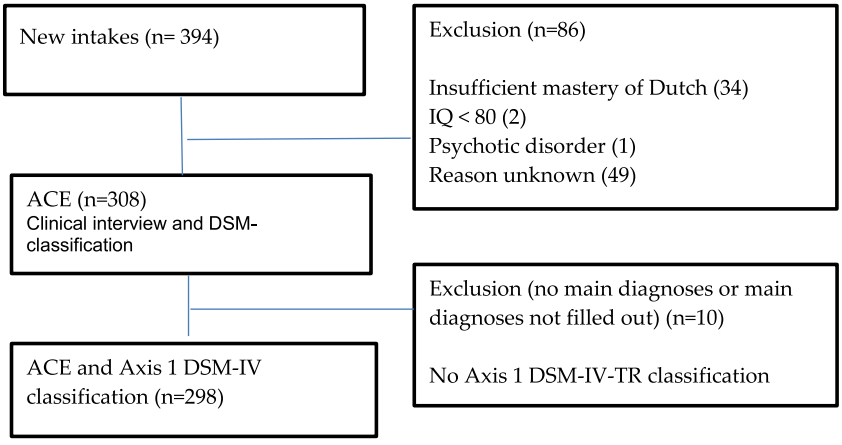

Fig. 1. Flowchart ACE and DSM-IV-TR classification.

Table 2
Sample characteristics stratified for ACE-group.

Variable	Total (*N* = 298)	ACE <4 (*N* = 192, 64.4%)	ACE ≥4 (*N* = 106, 35.6%)	χ^2 / *t*-test
Gender				$\chi 2 = 2.32$
Male, *N* (%)	130 (43.6%)	90 (46.9%)	40 (37.7%)	
Female, *N* (%)	168 (56.4%)	102 (53.1%)	66 (62.3%)	
Age (years), *M* (SD)	38.78 (SD = 11.32)	38.96 (SD = 11.50)	38.43 (SD = 11.02)	$t = 0.39$
Age range (years)	20–62	20–62	20–59	
ACE, *M* (SD)	2.92 (SD = 2.69)	1.18 (SD = 1.11)	6.06 (SD = 1.64)	$t = -27.30^{***}$
AAE, *M* (SD)	2.50 (SD = 2.31)	1.63 (SD = 1.70)	4.09 (SD = 2.42)	$t = -9.33^{***}$
AAE < 4, *N* (%)	216 (72.5%)	167 (87%)	49 (46.2%)	$\chi 2 = 56.87^{**}$
AAE ≥ 4, *N* (%)	82 (27.5%)	25 (13%)	57 (53.8%)	
Psychiatric comorbidity, *N* (%)				
No	149 (50%)	102 (53.1)	47 (44.3)	
Yes	149 (50%)	90 (46.9)	59 (55.7)	
Any PTSD, *N* (%)				
No	241 (79.9%)	166 (86.5%)	75 (70.8%)	$\chi 2 = 10.89^{**}$
Yes	57 (19.1%)	26 (13.5%)	31 (29.2%)	
Depression, *N* (%)				
Main diagnosis	112 (37.6%)	76 (39.6%)	36 (34%)	
Comorbidity	51 (17.1%)	34 (17.7%)	17 (16%)	
Anxiety, *N* (%)				
Main diagnosis	78 (26.2%)	50 (26%)	28 (26.4%)	
Comorbidity	51 (17.1%)	35 (18.2%)	16 (15.1%)	
PTSD, *N* (%)				
Main diagnosis	41 (13.8%)	20 (10.4%)	21 (19.8%)	
Comorbidity	19 (6.4%)	7 (3.6%)	12 (11.3%)	
Other, *N* (%)				
Main diagnosis	67 (22.5%)	46 (24%)	21 (19.8%)	
Comorbidity	28 (9.4%)	14 (7.3%)	14 (13.2%)	
Main diagnosis [a]	–	–	–	$\chi 2 = 5.48$
Comorbidity [b]	–	–	–	$\chi 2 = 16.36^{*}$
Somatic comorbidity[c]				
No	182 (65.0%)	120 (65.6%)	62 (63.9%)	$\chi 2 = .08$
Yes	98 (35.0%)	63 (34.4%)	35 (36.1%)	

Note. N = Number; M = Mean; SD = Standard deviation.
[a] = Categorical variable that represents the main diagnosis of participants (1 = depression, 2 = anxiety, 3 = PTSD, 4 = other).
[b] = Categorical variable which represents comorbidity in the sample by explicitly taking the second diagnosis into account, sorted by the main diagnosis of participants. E.g. If a case has the main diagnosis depression and the second diagnosis PTSD, that case is treated as 'depression with comorbidity'. If a case has no second diagnosis, this case is treated as 'depression'.
[C] = N was 280 in this analyses, because of missings on Axis 3 diagnosis.
* = $p < .05$.
** = $p < .01$.
*** = $p < .001$.

39 years (SD = 11.32).

3.3. ACE

298 patients had both ACE scores and Axis 1 DSM-IV-TR classifications. The mean ACE score of the total sample was 2.92. Sixty-eight (22.8%) patients reported no ACE. 175 (58.7%) scored more than one ACE. One hundred six (35,6%) patients scored ≥4. The difference in mean score between patients with ACE <4 and patients with ACE ≥4 was large and significant: 1.18 versus 6.06 ($p < .001$). Mean scores in ACE did not differ significantly between main Axis 1 diagnostic classifications, except for Depressive disorder (Mean 2.46, SD 2.45) versus PTSD (Mean 4.15, SD 2.87), $P = .003$. Nineteen percent of patients had a diagnosis of PTSD and this group had significantly more persons with ACE ≥4 scores compared to non-PTSD classifications in the sample ($p < .01$).

3.4. AAE

The mean AAE score was 2.50. Sixty-eight (22.8%) patients reported no AAE. Eighty-two (27.5%) patients scored ≥4 on the AAE. The difference in mean AAE score between patients with ACE <4 and patients with ACE ≥4 was large and significant, 1.63 versus 4.09 ($p < .01$). The ANOVA showed that mean scores in AAE did not differ significantly between main Axis 1 diagnostic classifications, except for Depressive disorder (Mean 2.20, SD 2.17) versus PTSD (Mean 3.76, SD 2.57), $P = .001$, and for Anxiety (2.27, SD 2.21) versus PTSD (Mean 3.76, SD 2.57), $P = .004$.

3.5. Comorbidity

Psychiatric comorbidity occurred in 50% of cases in this sample, and this comorbidity was higher in the patients with ACE ≥4.

Somatic comorbidity occurred in 35% of the sample and its occurrence was not significantly higher in the group with ACE ≥4 compared to the group with ACE <4. Results were also non-significant when analysed for males and females separately.

3.6. Other analyses

AAE scores were significantly ($t = -9.33$, $p < .001$) higher (4.09 SD 2.42) in the ACE ≥4 group compared to the low ACE group (1.63 SD 1.70), indicating general revictimization. Logistic regression analysis, correcting for age and gender, showed a significant association between ACE group and AAE (OR = 7.88, $p < .001$, CI: 4.38–14.15), indicating that patients with an ACE score ≥4 have almost eight times the odds of an AAE score of four or more. The interaction term, gender by ACE, was non-significant, indicating that the effects did not differ for males and females. In case of sexual trauma in childhood, 42,9% experienced sexual trauma as adult, versus only 2.1% in case of no sexual ACE,

indicating an association between childhood sexual trauma and sexual revictimization ($\chi 2 = 86.14$, $p < .001$). Logistic regression analysis, correcting for age and gender, showed a significant association between sexual trauma in childhood and in adulthood (OR = 38.34, $p < .001$, CI: 13.19–111.52), indicating that patients with a childhood sexual trauma have almost 38 times the odds of a sexual trauma in adulthood. The interaction term, gender by childhood sexual trauma, was non-significant, indicating that the effects did not differ for males and females.

4. Discussion

4.1. Main findings

This study shows that 22.8% of patients presenting themselves at a specialty mental health outpatient clinic for anxiety and depressive disorders in the Netherlands reported no ACE, and 22.8% reported no AAE. 77.2% reported at least one ACE, 58.7% scored multiple traumas and 35.6% reported ACE ≥4. These percentages are generally higher than in the original ACE field study amongst 17,000 people visiting a medical evaluation center in the USA, reported by the Center of Disease Control in 2016, where sixty-four percent reported at least one traumatic experience during childhood and eighty-seven percent of people reporting traumatic experiences had experienced multiple traumas (Prevention Centers for Disease Control and Prevention 2016).

The mean ACE score of the total sample was 2.92, which is relatively high, and the mean score of > six in patients with an ACE ≥4 indicates that the burden of traumatic childhood experiences is significant in the patient group with anxiety and depressive disorders. We found no significant difference in mean scores between the different depressive, anxiety and other main classifications in DSM-IV-TR Axis 1, except for the difference in mean score between depression and PTSD, which was significantly higher in PTSD. In addition, the ACE ≥4 scores were significantly higher in patients with PTSD. High levels of ACE are generally expected in PTSD, however, patients with anxiety and depressive disorders tend to suffer high levels of Adverse Childhood Experiences, even in the absence of PTSD. This confirms our first hypothesis.

We further hypothesized that high ACE scores would be associated with mental and somatic comorbidity. Our findings confirm that high ACE scores are related to psychiatric comorbidity, which occurs in half of the patients. This finding is of clear clinical significance. Our findings do not confirm the part of our second hypothesis regarding somatic comorbidity, as no significant association between ACE and somatic comorbidity could be established in this sample. Hence comorbidity between depressive or anxiety disorders and chronic medical conditions may not be expected more in case of ACE in these patients. In view of the ambiguous findings in general population studies in this respect, further research with a specific focus on this matter could lead to more, much needed insight.

Our third hypothesis is confirmed. High ACE scores are associated with revictimization, both general and sexual. This might have to do with a higher level of risk-taking behaviour, such as smoking, drinking, sexual risk-taking and interpersonal aggression (Hughes et al., 2017). As these variables were not available in this study, this should be a subject of further research.

4.2. Limitations of the study

This is a retrospective study. Reuben et al. found that retrospective assessments tend to overreport somatic illness associated with ACE compared to prospective assessments (Reuben et al., 2016). However, as the ACE study in the USA was retrospective as well, the findings concerning somatic illness of this study can be compared with those in the ACE study. Furthermore, even if overreporting would have been the case, the findings of this study do not support an association between somatic comorbidity in adult life, and high ACE scores. On the other hand, underreporting of somatic comorbidity might also have occurred in this study, as the focus at intake might be mostly at the psychological issues.

Another limitation regarding somatic comorbidity is the possible role of setting in this study. There might be a selection bias here as patients with obvious somatic comorbidity might have ended up in other health services such as mental health services in general hospitals, instead of a specialty mental health clinic. Prospective studies exploring this association based on systematic assessment of not only psychiatric but also somatic medical conditions in several health care settings would be needed to establish this further.

A more societal limitation of the study is that it is a study in the Netherlands, and persons unable to fill in Dutch questionnaires could not participate in the study. These immigrants might have different ACE and AAE than persons who grew up in the Netherlands. This was the case in 34(8.6%) of 394 eligible patients. Also, trauma or attention to trauma may be experienced differently in the Netherlands compared to other countries. However, the ACE-IQ was developed for use in different countries and cultures. The ongoing field studies may shed further light on this possible limitation.

A limitation of the ACE-IQ that we used to measure ACE, is that it does not consider the frequency, duration or severity of each exposure (Felitti et al., 1998). For example, one instance of sexual abuse is counted the same as ten years of repeated rape (Smith, 1995). Other questions of the ACE-IQ however do consider frequency, by asking 'did you often of very often…'. The simplicity of the ten items of the ACE-IQ is a great strength, but consequently also leads to the missing of exposures that could also be considered abuse (Finkelhor et al., 2015). Also, the ACE variables represent the perception of the measured trauma and should therefore be considered with caution, given that they possibly can be influenced by adulthood personality and complex social conditions.

4.3. Clinical implications

In the clinical setting systematic attention should be paid to ACE in anxiety and depressive disorders, especially in case of comorbid mental disorders, and not only in PTSD. Moreover, so far, in PTSD often most attention is paid to current traumas but ACE can contribute to PTSD and treatment should consider that.

Another clinical implication may be to explore behaviour that might be involved in revictimization, such as addictive behaviour and risk-taking, in patients with ACE, in a systematic way, and to devise new interventions for this risk group with the specific aim to prevent (further) revictimization. Although this aspect currently is certainly part of clinical practice, this is not systematically done. Structured interventions should be devised and their feasibility evaluated for this purpose.

4.4. Research implications

The findings are an underpinning for the distinction that has been made between type 1 trauma, being one traumatic experience, and type 2 trauma, being chronic traumatisation, which is supposed to lead to more complex psychiatric disorders than PTSD only (Draijer, 2003). In DSM-5, a new section disorders related to trauma and stressors has been formed and the possibility to indicate repetitive trauma is introduced (American Psychiatric Association 2013). Further research is needed exploring new interventions that provide the possibility to treat both childhood and current traumas in an effective way, both in PTSD as in anxiety or depressive disorders with psychiatric comorbidity; so far, this is a challenge in clinical practice. Further research incorporating outpatients ongoing treatments could reveal interesting information for clinical practice.

Also, the findings regarding the lack of association between somatic comorbidity and ACE or AAE scores warrant further systematic research

in view of the ambiguous findings in the general population and the negative findings in this clinical epidemiological study.

The issue of revictimization should be addressed in clinical research as well. Several avenues can be considered for this, ranging from development and evaluation of preventive interventions in children at risk to development of interventions specifically aimed at prevention of further revictimization in afflicted adults.

Furthermore, in the current study no data were available regarding offending variables. Given that offending and victimization are often two sides of the same coin in terms of the behavioural repertoire of the individual (Craig et al., 2017; Wolff and Baglivio, 2017), this is interesting subject for further research. Given the previous finding that the effects of ACE vary across racial and ethnic groups, this should be taken into account (DeLisi et al., 2017).

5. Conclusion

In this specialty mental health outpatient setting for depressive and anxiety disorders, both ACE and AAE are significantly higher than in the general population, and mostly in case of PTSD. Psychiatric comorbidity is associated with higher scores, somatic comorbidity is not. Clear indications for general as well as sexual revictimization exist. Further research is needed.

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Conflict of interest statement

No conflicts of interest.

Contributors

CF and AD designed the study; CF oversaw the study. EP and AD collected the data; CF, RK and IE performed the statistical analysis; CF, EP, AD and JE contributed to the interpretation of the results; CF took the lead in writing the manuscript. All authors provided critical feedback and contributed to shaping the research analysis and manuscript.

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None.

Supplementary materials

Supplementary material associated with this article can be found, in the online version, at doi:10.1016/j.jad.2018.12.096.

Appendix: Questions asked in the ACE-IQ and AAE-IQ questionnaires (2015 version)

ACE-IQ: When you were growing up, during the first 18 years of your life…

AAE-IQ: In your adult life (≥ 18)…

1 Did a parent, guardian or other household member yell, scream or swear at you, insult or humiliate you? Or treat you in such a way you feared getting injured?
2 Did a parent, guardian or other household member spank, slap, kick, punch or beat you up? Or hit you so hard you got injured or had visible injuries?
3 Did someone at least five years older than you, touch or fondle you in a sexual way when you did not want them to? Or make you touch their body in a sexual way when you did not want them to? Or attempt or actually had oral, anal, or vaginal intercourse with you when you did not want them to?
4 Did you often or very often feel no one in your family loved you, or found you important or special? Or did you often of very often feel your family did not pay attention to each other, was not connected to each other and did not support each other?
5 Did your parents/guardians not give you enough food, let you wear dirty clothes and made you feel no one protected you? Were your parents/guardians too drunk or intoxicated by drugs to take care of you?
6 Were your parents ever separated or divorced?
7 Was your mother or stepmother often or very often pushed, grabbed, beaten or was something thrown at her? Or is your mother or stepmother sometimes, often, or very often kicked, bitten or struck with a fist or a hard object? Or has your mother or stepmother ever been repeatedly beaten for several minutes or threatened with a pistol or knife?
8 Did you live with a household member who was a problem drinker or alcoholic, or misused street or prescription drugs?
9 Did you live with a household member who was depressed, mentally ill or suicidal?
10 Did you live with a household member who was ever sent to jail or prison?

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